



TECHNOLOGY IN MOTION

Clean air at home

TIPS FOR OPTIMUM ROOM CLIMATE

FOR THE PROTECTION OF HEALTH & BUILDING STRUCTURE



People spend 90% of their time indoors

Healthy air is the basis for life. Air pollution, smog or exhaust gases are all hotly discussed while huge investments are made in ensuring clean air outdoors. This is right and correct. However, we only spend about 10% of our time outdoors.¹⁾

The air quality of our indoor spaces is then arguably far more important for our health. Indoor spaces are often highly polluted with fine dust, mould spores, bacteria, viruses and gases. The quality of the breathing air has a significant influence on our health, mental fitness and mood.

Bad air does not always have an odour

Have you experienced this? You enter a meeting room or a restaurant, and a cloud of stale air hits you. The people in the room have not noticed it or simply just got used to the bad air. While temperature and humidity are palpable, bad indoor air cannot always be smelled.

Proper ventilation behaviour is essential for a healthy, pleasant indoor climate and at the same time is simple and effective for everyone. We will show you how!



Shock? Cross? Night? Ventilation methods in comparison

Which natural type of ventilation is the most effective? Clearly, it's two opposite windows which are wide open – a so called cross ventilation. However, since very few rooms are designed this way, shock ventilation is the most common. Air circulation is created by open windows in different rooms and open interior doors. This method allows the ventilation of rooms to happen very quickly filling them with fresh air. When windows etc are then closed it enables rooms to quickly heat again.

Tilted windows? These are best being used in summer, when temperatures between indoor and outdoor don't differ much and a permanent air ventilation is the aim.

Small helpers: The most effective way is to integrate user-independent window ventilation and to support with shock ventilation where required (see MACO products from page 10).

The golden rules of ventilation



Never below 16 degrees

Cold room air can absorb less water than warm air. Moisture then settles on walls, windows, etc. and there is a risk of mould forming! A room temperature of 16 degrees is therefore the minimum.



How long?

5 to 10 minutes are enough, then a large part of the air volume has been renewed and you can breathe freely again. The colder the outside temperature, the shorter the ventilation intervals can be.



When? How often?

The air is stuffy or stale? Condensation forms on the window? Then it's high time for shock ventilation. The more time spent in the living room, the more intensive the ventilation. Ventilation should be done four to five times a day.



Special humidity tips Just had a long shower?

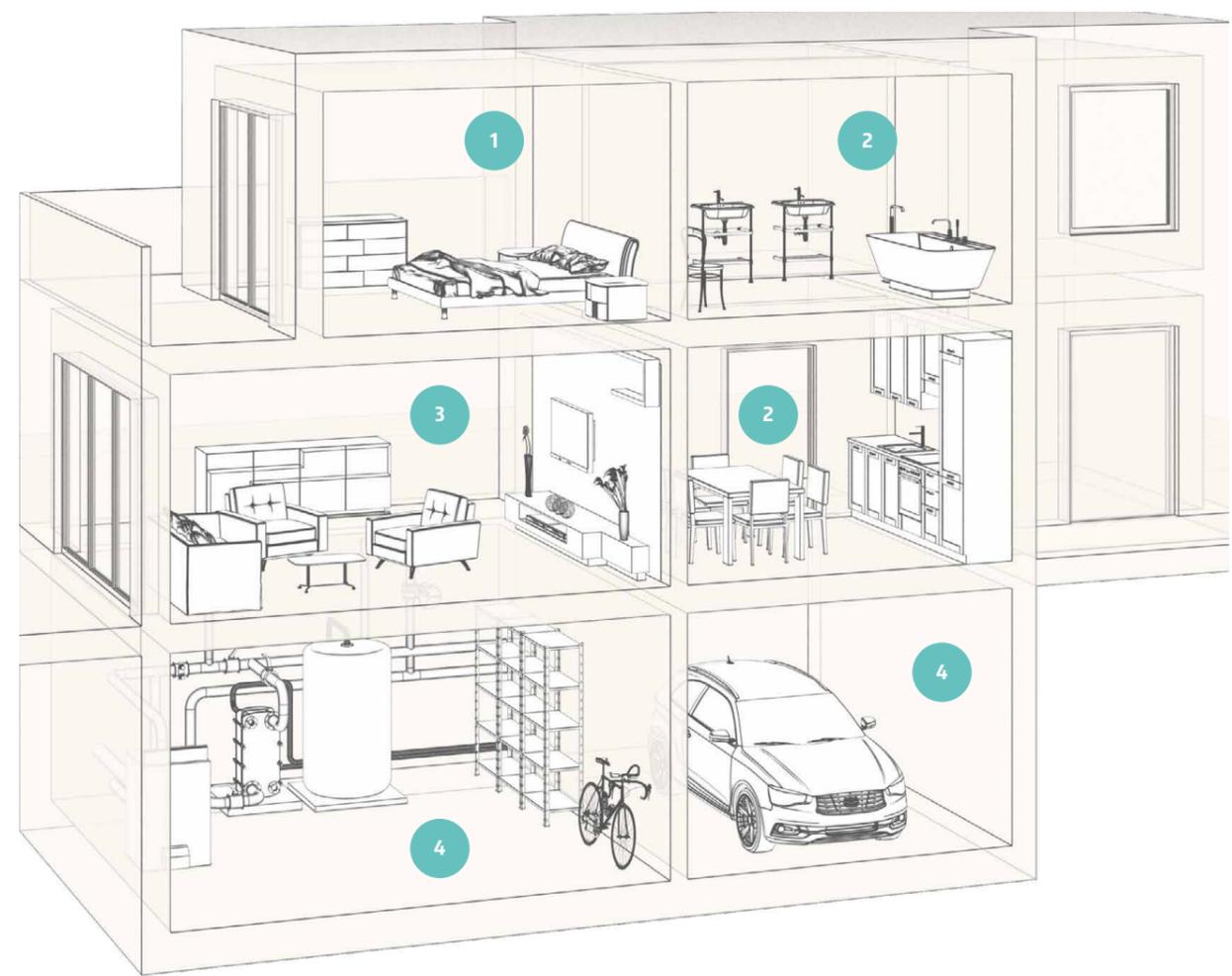
Then, keep the bathroom door closed when airing, otherwise the moisture will be distributed throughout the subsequent rooms. The doors to low-heated rooms should also be kept closed when ventilating.

Fresh air

In your own 4 walls

Whether it's the bathroom, basement or bedroom – we use rooms differently. Therefore, room humidity and odours also vary depending on the living area. A few small tips will help you to create a healthy indoor climate. For example, it is important to remove moisture, pollutants and viruses on the spot if possible and the simple way to do this is ventilation.

- 1 Bedrooms**
Summer: Windows open / tilted at night
Winter: Ventilate 5 – 10 minutes before sleeping; after getting up shock ventilation
- 2 Bath / Kitchen**
Moisture extremes (when cooking, showering, etc.) should be immediately eliminated by shock ventilation, doors remain closed, avoid textile materials



- 3 Living room**
Regular shock ventilation, plants, aquariums or other sources of moisture increase the ventilation interval
- 4 Cellar / Garage**
Ventilate at night or in the morning (outside should be at least 5° cooler than inside temperature).
Winter: ventilate at any time of the day

Humidity hazard!

Rooms particularly at risk

Basement
The surface temperature of the outer cellar walls is lower than the inner walls. These temperature differences are exacerbated by the ingress of warm air in summer where condensation can settle on the wall. Cellar rooms that are permanently used should be heated and have windows for ventilation.

Proper heating
Throttle back the heating during absence and at night? This saves energy, but pay attention to humidity; if it is high, ventilation and reducing the temperature always go hand in hand. This facilitates the drying process.
And radiators should be free – curtains, oversized window sills or an incorrectly placed fixture hinder the heating performance. In the worst case, the desired room temperature is no longer reached.

Unused Rooms
It makes sense to slightly heat even small or unused rooms. It's not so smart if you heat them with warm air from warmer rooms, as this allows not only heat in, but also moisture. When the air then cools down again, the relative humidity increases and there is a risk of mould.

Drying laundry indoors
Drying laundry outdoors is ideal! Is there a drying room available? Also perfect! However, if you wash or dry in the living area, think about airing. Open the windows in your "Wash and dry room", close the door and do not turn off the heating. Your apartment will thank you for it.
By the way – when using tumble dryers, the exhaust hose should always be placed outdoors.



Did you know...? Amazing facts and figures^{2) 3)}

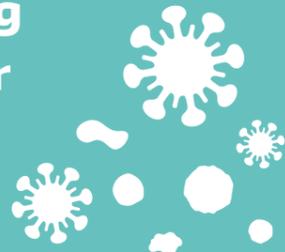


An adult breathes in
15,000 litres of air every day
and releases about
one litre of water into
the ambient air



90% of our time,
we spend indoors

Viruses and bacteria remain in the
form of aerosols for a very long time in
standing room air

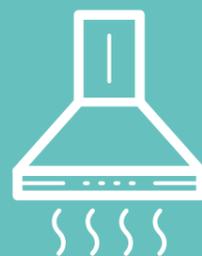


Alone in Europe, more than
80 million people
live in damp or mouldy rooms



Due to poor indoor climate, the
probability of getting
Asthma and allergies
increases to 40%

The air in our apartments,
homes and buildings is up to
5 times more polluted
than outdoors



Room climate Why is ventilating so important?

Dense buildings > no air exchange

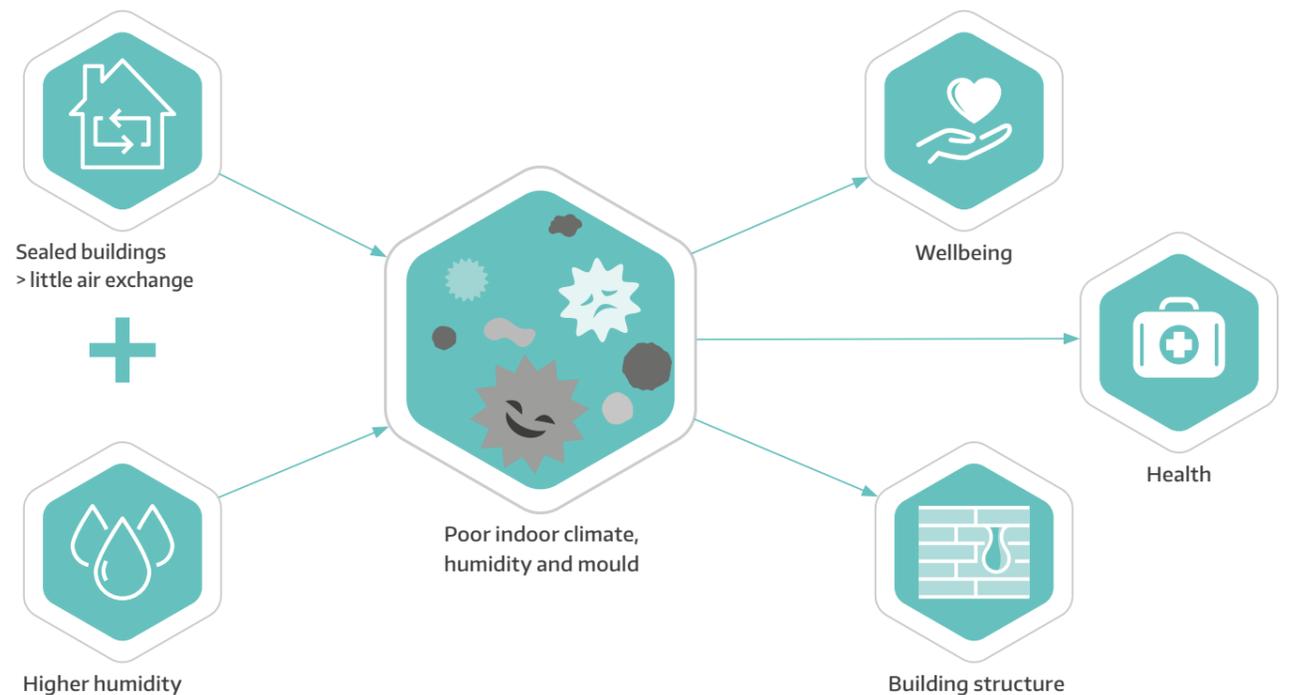
In recent decades, residential construction has continued to develop. Increasing demands on comfort, aesthetics and energy saving have significantly changed house building (e.g. EnEV 2014). Buildings have been increasingly insulated and made as energy-efficient as possible, thanks to technical innovations in windows and doors. At the same time, they are theoretically completely airtight due to the elimination of fireplaces or openings such as the letter box slot.

However, a sealed building shell has an extremely poor indoor climate. A natural air exchange hardly takes place any more. Humidity, chemical evaporations such as paint and building materials, CO₂, pathogens and particulates pollute the room air. These impurities are already produced by breathing, bathing, wet laundry, and the operation of computers or vacuum cleaners.

+ Increasing humidity supply = poor indoor climate

At the same time, a household's moisture levels have increased compared to previous generations. This high humidity can hardly escape due to the sealed building shells. The consequences are that renovated or even new apartments with a lack of ventilation concept sometimes have a worse indoor climate than old buildings.

The solution: A ventilation strategy adapted to the living space that takes all these factors into account and supports you as a resident in the correct behaviour.





Protection of building substance

Especially in new construction or renovation work, increased ventilation is essential to dry the building and to dissipate the chemical evaporations of paints, plaster and other material. For this, it takes one to two years for solid construction, which usually incorporates more building moisture than for light and prefabricated houses. You can expect higher heating costs for those periods. Tip: Use dehumidifiers and save time.

Correct ventilation? Especially in times of a pandemic

It is now clear that the transmission of viruses (e.g. Corona Virus) occurs where humans overwhelmingly spend their time (approx. 90%), maintain their contacts and share their breathing air – in buildings and on public transport. Scientific studies show that there is a much higher risk of contagion to COVID-19 indoors.⁴⁾

Aerosols are an important carrier. These are microscopic droplets which we emit through exhaling and which may contain viruses. These practically float in the room air and are permanently exhaled by each infected person. And all the other people in the room inhale them, even at a distance.

Frightening? Yes, but here too ventilation can help by regularly replacing the air volume completely by shock ventilation for several minutes, thereby keeping the concentration of aerosols as low as possible.

Health - our most important asset

Clean, fresh breathing air – this is our livelihood. Poor indoor air, on the other hand, can cause short-term irritation of the eyes, nose and throat, as well as headaches, dizziness and fatigue. In the long term, serious ailments such as respiratory diseases (e.g. Asthma, chronic obstructive pulmonary disease (COPD)) or heart disease can occur as a result.^{2) 3)}

In the event of illness, extensive ventilation is essential, as it promotes one's own recovery and at the same time minimises the risk of infection for others. And because pathogens sometimes remain in closed rooms, most notably when there is little air exchange.

Mould? A risk for human & home

Mould loves a humid, warm environment. It's perfect breeding ground? High humidity, paired with warm room temperatures and poor ventilation as well as increased humidity in the building structure.

In high concentrations, mould can not only attack the building structure, but can also become unpleasant and even dangerous for humans. For example, the Fraunhofer Institute found links between poor indoor air and diseases such as Asthma or other respiratory diseases. Those who live in a damp or mouldy apartment for a long time, and this is approx. 80 million people in Europe alone, have an increased risk of Asthma by 40 percent.^{2) 3)}

Well-being - the ideal mix

A pleasant indoor climate only occurs if you feel comfortable with the temperature and humidity. A quiet, windless living space is also important for the quality of living. In order to avoid draughts and noise, many people do not ventilate, especially in urban environments. This is understandable, but this behaviour inevitably leads to bad indoor air.



Teamwork

Ventilation solutions for every requirement

If manual tilting or opening for shock ventilation is not possible, whether due to absence from home or because a barrier-free operation is needed, then other alternatives have to be available.

Natural living room ventilation has different facets. A variety of solutions from easy & quick to comprehensive & smart-home capable supports you with this. Here is an overview.



MACO Secuair



MACO Vent



MACO E-hardware



HAUTAU PRIMAT compact 195

MACO Vent

Effective solution for mold prevention

Preventing moisture and thus mold - this is made possible by the window rebate valve, MACO Vent. This protects the building fabric as well as your health.

Completely independently, MACO Vent provides the necessary minimum ventilation. Automatically closing the flap when wind speeds are too high making draft a thing of the past. The intelligent air ducting also regulates the temperature of the supply air, thus preventing severe cooling. This means that the quality of air and living quality in the rooms remains high at all times. Regardless of whether someone is thinking about ventilating and without having to open a window.

MACO Vent is hidden in the window rebate and can be retrofitted quickly with only two screws into existing PVC windows. In addition, it is maintenance-free!



MACO Secuair Tilting with security

Leaving the house with a secure feeling when windows are tilted! No need to be afraid of uninvited guests or a surprise rain shower. The secured ventilation position of MACO Secuair ensures energy-efficient, continuous ventilation even in long absences due to its reduced tilting distance and thereby guarantees protection up to RC 2 burglary resistance class. The usual window operation is supplemented by an additional handle position.



MACO E-hardware Smart ventilation

Even on the go, you can tilt your windows at any time and provide fresh air in your home before you get home. The E-hardware makes this possible and tilts automatically in combination with rain sensors and timers. In doing so, it adapts the window to the habits of the occupants.

The E-hardware should already be considered during construction planning. It is installed invisibly in the window sash and connected to a wall switch or alternatively via smart phone or intelligent home control. Nevertheless, the E-hardware can be manually operated at any time.



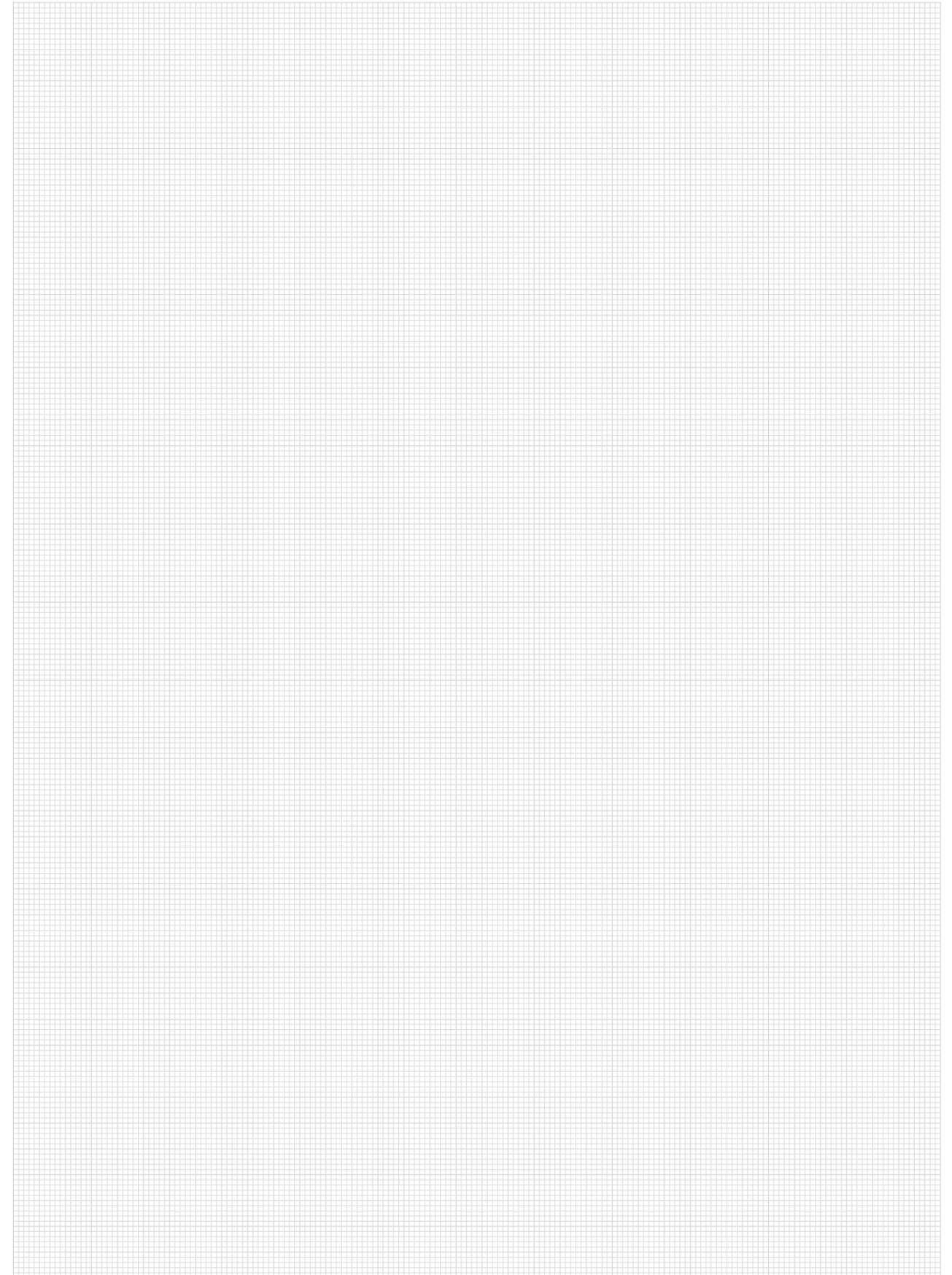
HAUTAU MS multi-sensor Climate monitor for automated ventilation

HAUTAU MS ensures a permanently good indoor climate, especially in busy rooms, for example in schools or office buildings. The multi-sensor reliably monitors temperature, humidity and CO₂ content in the room. The digital displays provide information about the current values at all times.

When the individually adjustable limit values are exceeded, the multi-sensor automatically regulates the ventilation via the connected window drive, e.g. the retro-fittable, electric skylight opener HAUTAU PRIMAT compact 195. Thereby, nothing more stands in the way of a controlled, natural ventilation for maximum living comfort.

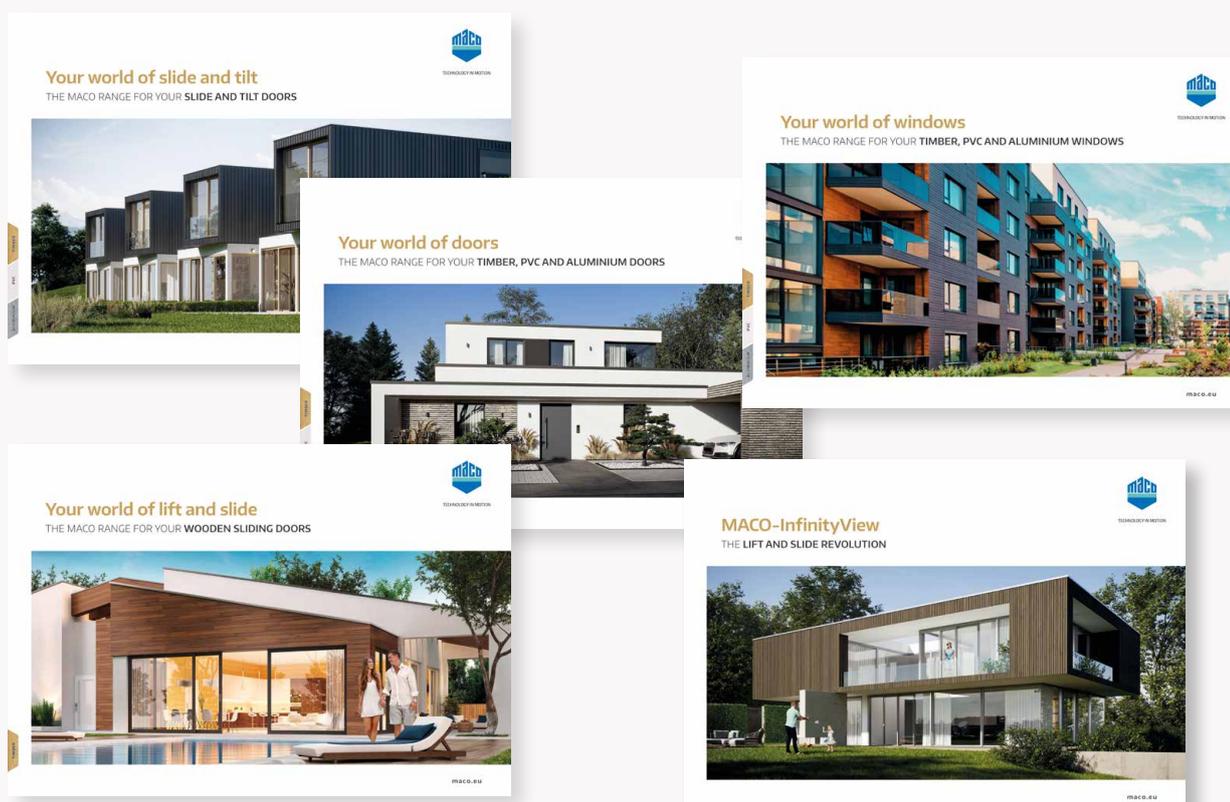


Notes



Any Questions?

There are ventilation products not only for windows, but also for large-surface elements such as lift&slide doors. We would be happy to inform you about all of our solutions or together create a ventilation concept for your home.



Text sources:

- 1) WHO: http://bit.ly/who_health_stressors_indoor
- 2) EPA: http://bit.ly/indoor_air_quality and http://bit.ly/indoor_air_quality_2
- 3) Fraunhofer Institute: http://bit.ly/energieeffizienz_raumklima
- 4) medRxiv: http://bit.ly/transmission_corona and http://bit.ly/aerosole_CoV-2

Image sources: MACO, HAUTAU, Adobe Stock

MACO near you:
www.maco.eu/contact



This print document is constantly being revised.
The current version can be found at <https://www.maco.eu/assets/759192>
or by scanning the QR code.

Created: 01/2015, Modified: 06/2021
Order No. 759192
All rights and amendments reserved.